

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (CURRENTLY AMENDED) A polyprotein comprising external immunogens of at least two membrane-associated proteins of variola major or immunologically cross-reactive poxviruses, wherein each of said external immunogens comprise a portion of said membrane-associated protein comprising the external epitopes.
2. (ORIGINAL) An immunogenic composition comprising the polyprotein of claim 1.
3. (WITHDRAWN) An isolated nucleic acid encoding the polyprotein of claim 1.
4. (WITHDRAWN) An immunogenic composition comprising the nucleic acid of claim 3.
5. (WITHDRAWN) A eukaryotic cell comprising the nucleic acid of claim 3.
6. (WITHDRAWN) The eukaryotic cell of claim 5, wherein the eukaryotic cell is a mammalian cell.
7. (ORIGINAL) The polyprotein of claim 1 wherein the immunologically cross-reactive poxvirus is vaccinia virus.
8. (CURRENTLY AMENDED) A polyprotein comprising external immunogens of at least two poxvirus membrane-associated proteins selected from the group consisting of: M1R, A36[[r]]R, I5R, B7R, F8L, A30L, L1R, A33R, H5R, B5R, D8L and A27L, wherein each of said external immunogens comprises a portion of said membrane-associated protein comprising the external epitopes.
9. (ORIGINAL) The polyprotein of claim 8 comprising external immunogens of M1R, A30L, and A36R.

10. (CURRENTLY AMENDED) A polyprotein comprising external immunogens of at least two membrane-associated proteins, wherein antibodies against one of the proteins are synergistic with antibodies against the at least one other protein and wherein the synergistic antibodies recognize A36R of variola major or A33R of vaccinia.

11. (CANCELED)

12. (WITHDRAWN) A method of inducing an antibody response comprising: administering the polyprotein of claim 1 or 8 to a mammal.

13. (WITHDRAWN) A method of inducing an antibody response comprising: administering the immunogenic composition of claim 2 or 4 to a mammal.

14. (WITHDRAWN) A method of making an immunogen comprising: identifying a vaccinia protein that induces neutralizing or synergistic antibodies; aligning the protein sequence of the vaccinia protein with its variola homolog; synthesizing a nucleic acid sequence encoding at least an external segment of the variola protein; and causing said nucleic acid to be expressed as a polypeptide.

15. (WITHDRAWN) The method of claim 14 wherein the causing step comprises transformation of a eukaryotic cell in vitro.

16. (WITHDRAWN) The method of claim 14 wherein the causing step comprises administration of the nucleic acid to a mammal.

17. (WITHDRAWN) A method of making an immunogen comprising: identifying a vaccinia protein that induces neutralizing or synergistic antibodies; aligning the protein sequences of multiple isolates of the vaccinia protein with multiple isolates its variola homolog; determining a variola consensus sequence; synthesizing a nucleic acid sequence encoding at least an external segment of said consensus sequence; and causing said nucleic acid to be expressed as a polypeptide.

18. (CANCELED)

19. (CANCELED)

20. (CURRENTLY AMENDED) An immunogenic composition comprising a complex of polypeptides wherein each polypeptide comprises an external immunogen of a membrane-associated protein of variola major or immunologically cross-reactive poxviruses, wherein each of said external immunogens comprises a portion of said membrane-associated protein comprising the external epitopes and wherein said complex is not an entire virus.

21. (PREVIOUSLY PRESENTED) The immunogenic composition of claim 20 wherein the polypeptides are biotinylated and the complex is formed by the addition of avidin or streptavidin.

22. (PREVIOUSLY PRESENTED) The immunogenic composition of claim 20 wherein the complex is formed by anchoring the polypeptides in a liposome or micelle.

23. (CURRENTLY AMENDED) A polyprotein comprising external immunogens of at least two membrane-associated proteins of variola major or immunologically cross-reactive poxviruses wherein the individual proteins are joined through a linker-spacer peptide and wherein each of said external immunogens comprises a portion of said membrane-associated protein comprising the external epitopes.

24. (PREVIOUSLY PRESENTED) The polyprotein of claim 23 wherein the linker-spacer peptide comprises SEQ ID NO. 33.

25. (ORIGINAL) The polyprotein of claim 23 further comprising an affinity tag.

26. (ORIGINAL) The polyprotein of claim 25 wherein the affinity tag is a poly-histidine tag.

27. (CURRENTLY AMENDED) An immunogenic composition comprising an immunogen made by the method comprising:

identifying a vaccinia protein that induces neutralizing or synergistic antibodies;

aligning the protein sequences of multiple isolates of the vaccinia protein with multiple isolates of its variola homolog;

determining a ~~variola~~ consensus sequence of said vaccinia protein and said variola homolog;

synthesizing a nucleic acid sequence encoding at least an external ~~segment~~ immunogen of said consensus sequence; and

causing said nucleic acid to be expressed as a polypeptide.

28. (CURRENTLY AMENDED) An immunogenic composition comprising a cocktail of immunogens made by the method comprising:

identifying a vaccinia protein that induces neutralizing or synergistic antibodies;

aligning the protein sequences of multiple isolates of the vaccinia protein with multiple isolates of its variola homolog;

determining a ~~variola~~ consensus sequence of said vaccinia protein and said variola homolog;

synthesizing a nucleic acid sequence encoding at least an external ~~segment~~ immunogen of said consensus sequence; and

causing said nucleic acid to be expressed as a polypeptide.

29. (CURRENTLY AMENDED) A polyprotein comprising immunogens of ~~one~~ two or more membrane associated proteins of variola major or immunologically cross-reactive poxviruses, wherein at least ~~one~~ two of said immunogens comprises a polypeptide or protein selected from the group consisting of external immunogens and complete proteins wherein each of said external immunogens comprises a portion of said membrane-associated protein comprising the external epitopes.

30. (NEW) The immunogenic composition of claim 27 wherein said consensus sequence is a variola consensus sequence.

31. (NEW) The polyprotein of claim 1 wherein said polyprotein is LAA.